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General method for the assessment of the durability of energy-related products

## EESTI STANDARDI EESSÕNA

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English version

## General method for the assessment of the durability of energy-related products

Méthode générale pour l'évaluation de la durabilité des produits liés à l'énergie

Allgemeines Verfahren zur Bewertung der Funktionsbeständigkeit energieverbrauchsrelevanter Produkte

This European Standard was approved by CEN on 13 February 2020.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN and CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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## European foreword

This document (EN 45552:2020) has been prepared by Technical Committee CEN-CENELEC/JTC 10 “Energy-related products – Material Efficiency Aspects for Ecodesign”, the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive (2009/125/EC).

The dual logo CEN-CENELEC standardization deliverables, in the numerical range of 45550 – 45559, have been developed under standardization request M/543 of the European Commission and are intended to potentially apply to any product within the scope of the energy-related products (ErP) Directive (2009/125/EC).

Topics covered in the above standardization request are linked to the following material efficiency aspects:

- a) Extending product lifetime;
- b) Ability to re-use components or recycle materials from products at end-of-life;
- c) Use of re-used components and/or recycled materials in products

These standards are general in nature and describe or define fundamental principles, concepts, terminology or technical characteristics. They can be cited together with other product-specific or product-group standards, e.g. developed by product technical committees.

This document is intended to be used by technical committees when producing horizontal, generic, and product, or product-group, standards.

NOTE CEN/CENELEC/JTC 10 is a joint TC, and uses either CEN or CENELEC foreword templates, as appropriate. The template for the current document is correct at the time of publication.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## Introduction

As energy-related products (ErP) can often not be completely recycled, and the benefits associated with material recovery cannot fully compensate the energy (and material) demand of the whole production chain, each disposed ErP also means losses in energy and materials. Therefore, increasing the durability of ErPs can contribute to a reduction in the quantity of raw materials used and energy required for the production/disposal of ErPs and consequently reduces adverse environmental impacts.

When considering durability, the trade-off between longer lifetime (reducing impacts related to the manufacturing and disposal of the product) and reduced environmental impacts of new products (compared to worse/decreasing energy efficiency of older products) needs to be considered. In addition, consumer behaviour and advances in technology have to be taken into account. Considerations such as these are addressed in the preparatory studies commissioned under Directive 2009/125/EC. Whilst such aspects establish a relevant context for this standard, they are not addressed in this document.

This document covers a general method for the assessment of the reliability and the durability of ErPs. Reliability represents the assessment of a probability of duration from first use to first failure or in-between failures. Durability is the whole expected time for this same period and not a probability. To cover other material efficiency aspects of a product, the generic standards on “General methods for the assessment of the ability to repair, reuse and upgrade energy-related products – EN 45554:2020”, “General method for assessing the ability of an energy-related product to be remanufactured – EN 45553:-”<sup>1</sup>, or equivalent standards can be taken into consideration.

This document describes a general assessment method that is intended to be adapted for application at a product or product-group level, in order to assess the reliability/the durability of ErPs.

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<sup>1</sup> Under preparation. Stage at time of publication: FprEN 45553:2020.

## 1 Scope

This document defines a framework comprising of parameters and methods for assessing the reliability and durability of ErPs. It is intended to be used in the preparation of product or product-group standardization deliverables.

NOTE 1 This document has been developed under standardization request M/543 of the European Commission to support Directive 2009/125/EC.

NOTE 2 Throughout this document, reference to 'user of this document' refers to those members of technical committees that are developing horizontal, generic, and product, or product-group standards. This document is not intended to be applied to generate product-specific information.

NOTE 3 Product-group, as used in this document, is an umbrella term used to refer to a group of products with similar properties and primary function(s).

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12973:2000, *Value management*

EN 45559, *Methods for providing information relating to material efficiency aspects of energy-related products*

EN 62308:2006, *Equipment reliability - Reliability assessment methods*

EN 62506:2013, *Methods for product accelerated testing*

EN 60812, *Analysis techniques for system reliability - Procedure for failure mode and effects analysis (FMEA)*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

Note 1 to entry: See CLC/prTR 45550 for additional definitions.

### 3.1 General definitions

#### 3.1.1 Terms related to reliability and durability

##### 3.1.1.1 durability

< of a part or a product >

ability to function as required, under defined conditions of use, maintenance and repair, until a limiting state is reached